

Statement

by

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before

Conference on Security and Cooperation in Europe

Madrid, Spain

3 December 1980

Mr. Chairman:

It is a deep irony that the subject of cooperation in science should be on the agenda of the CSCE. Communication and cooperation among scientists is a tradition of five centuries; indeed it is the very essence of science. Because, without communication, science is essentially pointless, science never has known international boundaries. Scientists from different countries first meet each other, in spirit as it were, in the printed pages of scientific journals; later perhaps at the international disciplinary Congresses sponsored by the International Scientific Unions; then in each other's laboratories. Sharing a common culture and set of values, even a common scientific language, no natural barriers need impede their communication.

However, science, once the hobby of enthusiastic amateurs, has become a principal preoccupation of governments. Worldwide expenditures, by governments, in support of fundamental research, approach \$18 billion annually, of which approximately one-third is provided by the U.S., one-third by Western Europe and Japan, one-third by the Eastern European bloc. Expenditures for applied research are about twice as great and similarly distributed.

This huge enterprise has become a leading edge of our worldwide culture. The vista of understanding obtained within our lifetimes is the great legacy that we leave to the future, analogous as it has been said, to the Gothic cathedrals built in an earlier time. And what a magnificent panorama it is. Allow me to sketch it for you:

An ever more certain picture of the cosmos now excites us, of the distribution of energy and matter, of the nature of celestial bodies, of how it all began and how it may end. Plate tectonics has become one of the great syntheses of science, explaining the movement of continents, mountain building, vulcanism, earthquakes, and the formation of ore bodies. Three decades of experimental high energy physics appear to have revealed what may be the ultimate structure of matter--the family of quarks which, together with the four fundamental forces, seem to suffice to account for the entire universe. Wonder of wonders! Detailed understanding of molecular interactions, of the behavior of matter in the solid, liquid and gaseous states, underlies the bulk of the newer technologies of our time. Chemistry has been transformed from a pot-boiling art to a profound science capable of reliable prediction and the ability to synthesize any desired molecular structure at will.

Yet none of this is more awe inspiring than the understanding gained of the nature of life, of enzymes the remarkable catalysts of nature, of the transduction of energy in living cells, of the remarkable complex functional organization of cells, of the messengers between cells, of the genetic apparatus and its control of metabolism, reproduction and embryogenesis, of the unimagined subtleties of the immune system. And what can be more remarkable than the realization that the human brain is capable of understanding itself?

Withal, the beauty thus revealed does not alone motivate this enterprise, nor induce governments to support it. They do so, rather, because of the technologies thus made possible. It is the insights so gained that have enabled the conquest of infectious disease, rendered malnutrition a problem of food distribution, not of understanding. Science has made possible the gifts of radio, television, jet aircraft, nuclear energy, communication and weather satellites, synthetic polymers, and the solid state devices that serve as the heart of computers, microprocessors, industrial robots and information processors. And it is science itself that revealed the need for further studies of the oceans, the atmosphere, soil conservation, climatic change, enhanced agriculture, alternative energy sources, and attention to the chronic diseases of later life (cancer, atherosclerosis, diabetes, arthritis, lupus, multiple sclerosis, schizophrenia, etc. etc.), the disorders so prominent now that the acute diseases that were the principal causes of death for most of human history have largely been brought under control. The great objectives of much of such science are to stabilize the biosphere, to enable a rational humanity to live in peace and comfort, in harmonious equilibrium with the limited physical resources of our small planet, seeking some higher human destiny, whatever that may prove to be.

Patently, that goal is still very remote from attainment and, for scientists, much more remains to be done than has yet been accomplished. That is why we need not only to communicate to each other in the scientific journals but to interact personally so as to refine our understandings, to stimulate each other's creativity. And surely we should share the great, expensive physical facilities (accelerators and telescopes, for example) of which the world needs no more than one each. But that is in the most ancient scientific tradition. Since the founding of the great European universities scholars have trekked to each other's libraries, laboratories, each other's presence. Scholarly exchange and freedom of inquiry are among the very foundations of the European intellectual tradition. And it is abundantly clear that the scientists of Eastern Europe treasure this tradition quite as deeply as do their Western colleagues.

It is taken as given that a new piece of information, a new understanding, gained anywhere benefits mankind everywhere, that no nation has a monopoly of talent, that all can benefit from the work of each of the others. Thus the scientific community really is trans-national--a single world community. Scientists engaged in East-West exchange must traverse bureaucratic governmental barriers--but they already know and identify with one another; no governmental intermediary is required to match laboratory with laboratory, or scientist with scientist. When a scientist first visits some country other than his own, he knows whom he wishes to see, and is welcomed as an old friend. And it has been the hope of the scientific community that these close human ties would also serve, in some measure, as stabilizing bridges of goodwill and mutual understanding, counters to the tensions that arise from conflicting ideologies and political practice.

Scientists have long taken the position that they are quite capable of managing their own affairs and have so proven, time and again. Happily, they persist in the notion that the advancement of knowledge is their business--not that of governments, believing that if the bureaucrats would kindly leave them alone, they could get on with their tasks. Unfortunately, governments must provide the wherewithal to finance exchange, for governments are, of necessity, the principal patrons of science, thereby acquiring a responsibility for the scientific enterprise that, from country to country, varies more in degree than in kind.

Accordingly, it is apparent that if the original provisions of the Final Act, all of them, were adhered to by the signatory countries, there would be little need to pursue the subject of scientific cooperation further within the CSCE context. But it was because that did not appear to be the case that the Scientific Forum at Hamburg assumed a character surely quite different from that anticipated when the provision for a Scientific Forum was written into the Final Act.

I was pleased to lead the American delegation to Hamburg--remember that that was a meeting of scientists, not of governments. But I went in a deeply troubled frame of mind.

When Soviet scientists began to attend international scientific congresses in the 1950s, they were warmly welcomed despite the irritation occasioned by the so-called "interpreters" who accompanied them--surely that pained our Soviet colleagues more than it pained us. And, happily, with time, that practice disappeared. But we have yet to learn to put up with the all too frequent event in which a distinguished

Soviet scientist accepts an invitation to give a paper at an international meeting--and then does not appear, or some unworthy substitute appears in his stead. We have yet to find acceptable the practice of issuing visas to Western scientists just shortly before their departure for the airport; yet to accept that diverse productive laboratories whose work appears in the scientific literature are unavailable to us in person; yet to appreciate why large, scientifically interesting areas of the Soviet Union--such as Kamchatka, the Arctic and the permafrost belt--should be closed to our earth scientists and biologists. Our bilateral exchange programs operate on the basis that normally the sending side nominates. But the receiving side is free to propose particularly welcome guests to the sender; we cannot understand why those suggestions are almost never acted upon favorably. And we shall never accept the mutilating censorship of scientific journals before they are deemed fit for the eyes of our Soviet scientific colleagues.

Presumably, Mr. Chairman, this was the genre of problems that was to have been thrashed out at Hamburg. According to our agenda we were also expected to identify significant areas of research and new modes of cooperation in the general fields of alternative energy sources, food production, and medicine, as well as in the humanities and social sciences. We did grapple with all of these subjects. But, as it happened, those were not the principal matters that occupied our attention.

By the time we had gathered, it was apparent that the scientists of the West were primarily concerned with what they considered to be serious infringements of the human rights and freedoms of too many of their scientific colleagues in the East. The Bill of Particulars is painfully long. Some, imprisoned, have become almost "household words"--Orlov, Scharansky, Kovalev--but there are also Bakhmin, Kukk, Marynovych, Nazarian, Skoudis, Velikanova and Zissels, for example. And, of course, there was the case of Andrei Sakharov, only recently exiled to Gorky. It matters not that not all of the list are truly distinguished scientists whose accomplishments have brought them worldwide repute; the transnational scientific community is as one, leaders and followers, the architects of the intellectual structure of science and the layers of the bricks in that structure. There are, in fact, only a handful of figures, worldwide, comparable to Sakharov. (He was not only a principal figure in the design of a military fusion device; it was also he who pointed out that if the Tokomak is to work, the plasma must be confined magnetically, not electrostatically as originally planned--and that remains the basis for our hope that contained fusion may, one day, become a major energy source for humanity.)

To be sure, also, none of the scientists who have been so grievously injured have been so treated because of their scientific activities. In general, the seeming transgressions for which they have been penalized so excessively have been either to have participated in monitoring their own government's adherence to the provisions of the Final Act or merely to have requested permission to emigrate--both activities vouchsafed by the Final Act itself. And it was attention to that circumstance that dominated our time in Hamburg.

And so, the Scientific Forum was not a scientific meeting as scientists use that term; its principal concern was the international scientific enterprise itself, including its rules of ethical conduct, rather than the substance of science.

That time in Hamburg was not wasted. The Report of the Scientific Forum--achieved by the same consensus process common to all CSCE meetings--contains several pregnant statements. Let me remind you of them:

It is observed that the present state of international scientific cooperation still requires improvements in various respects. Such improvements should be achieved bilaterally and multilaterally, at governmental and non-governmental levels, through intergovernmental and other agreements, international programmes and cooperative projects, and by providing equitable opportunities for scientific research and for wider communication and travel necessary for professional purposes.

The word "equitable" was mine. I know that it does not have an exact equivalent in most other languages. When I introduced it, I referred to its dictionary definition as "fair, just, and reasonable," and it is the meaningful word in that sentence.

The Report goes on to say that:

It is furthermore considered necessary to state that respect for human rights and fundamental freedoms by all States represents one of the foundations for significant improvement of their mutual relations and of international scientific cooperation at all levels.

It was our understanding, Mr. Chairman, that those two statements in the Report of the Scientific Forum constitute a firm acknowledgment of linkage between the strong endorsement of international cooperation in science and technology to be found in Basket II and the profound statements concerning human rights and fundamental freedoms to be found in Baskets I and III. These several elements cannot, any longer, be discussed as issues apart because they are not issues apart--they are indissolubly linked.

Ten months have elapsed since Hamburg. But the problems that so troubled us then seem even more serious today. Kovalev, Scharansky, Orlov remain imprisoned; their physical health deteriorates while mentally and emotionally they remain cut off from the world, denied access to scientific materials, forbidden to engage in scientific writing. And Andrei Sakharov languishes in Gorky. The plight of the so-called "refusenik" scientists remains unrelieved and, while this very meeting was in progress, Victor Brailovsky was summarily jailed.

Mr. Chairman, it was in 1973 that I first communicated to then President Mstislav Keldysh of the Soviet Academy my concern that if this pattern of activities continues, Western scientists--certainly American scientists--would, in due course, personally decide that their only effective means of protest would be to decline to participate in any form of exchange with the Soviet Union. It is with an aching heart that I report that that prediction is being borne out--and on a considerable scale.

Over these years a vast flow of letters and telegrams of protest has gone from the West to appropriate officials in the East--but to little avail. More recently, we have experienced increasing difficulty in securing hosts for Soviet scientists and scholars nominated to come to the States under our exchange programs. Be it said, however, that we work so assiduously at this process that, by sheer diligence we manage to identify willing, if somewhat reluctant, hosts for almost all nominees. How long that limited success will continue, I am uncertain.

In a remarkable act, some 8000 American scientists recently made known to Soviet officials that they are unwilling to participate in any manner in exchange programs with the Soviet Union. Let there be no mistake; these have not been actions prompted or organized by the administration of President Carter. They flow from the saddened hearts of individual scientists. And their attitudes will persist, their numbers will grow, regardless of who is in the White House,

unless there is some reasonable assurance that the course of events that so deeply troubles them will be reversed. And that is living proof of the validity of the Hamburg Communique, viz. respect for human rights and fundamental freedoms does represent a foundation for international scientific cooperation.

Mr. Chairman, last February the Council of the National Academy of Sciences of the USA suspended the program of bilateral colloquia and symposia cosponsored with the Soviet Academy. That unique action warrants fuller explication.

The Council is elected by the 1200 members of our Academy, the most distinguished scientists in our land. Accordingly, we are highly sensitive to the views and wishes of our membership. Over the years, our members have expressed their continuing frustration at our inability to mitigate the circumstances of the same group of Soviet colleagues. The exile of Andrei Sakharov, he whom the Nobel Prize Committee described as "the conscience of mankind," was a profound shock, deeply offensive to our most precious beliefs. But communication of that reaction elicited no response from Soviet officials.

Our exchange program, the first of its kind, is rather small compared to that which was subsequently inaugurated under intergovernmental auspices. The latter embraced all of the scientific and technical areas specifically enumerated in the text of Basket II and, at its height, involved some 220 specific projects within which some 1500 American and Soviet scientists, combined, visited each other's laboratories in 1979. Following the invasion of Afghanistan, this program was markedly reduced by the U.S. government, except for those projects relating to health and to environmental protection. But a breach of the terms of Basket I is the business of governments, not that of scientists, as scientists. Indeed, no mention of Afghanistan was made at Hamburg, nor did that unfortunate event have any effect on the inter-Academy exchange. But the exile of Andrei Sakharov was quite another matter.

How then could the Academy send to Soviet officialdom and to Soviet scientists an unmistakable message, conveying the depth of our concern, a clear signal that would amplify that which I had been sending since 1973, an indication that we could not satisfy our consciences by empty gestures or lengthy cablegrams that go ignored. Our exchange program was organized into two components--individual exchanges and organized bilateral meetings for which the two Academies, qua Academies, were responsible. In our Council's view, decisions



concerning the former, i.e., to visit a laboratory in the Soviet Union or to receive a Soviet scientist, must remain with each individual American scientist and his own conscience. The quota, in both directions, has been filled this year. But the quota is small and the American scientific community rather large.

However, the Academy per se is responsible for the bilateral meetings--the choice of topic, of site and of participants. Hence, it was this element, under its own control, that the Council suspended. Please understand, Mr. Chairman, how painful that decision was.

All of us were deeply reluctant to sever all communication with our Soviet colleagues by suspending the entire exchange program, knowing that the direct burden of such an action would necessarily fall on our scientist colleagues, not on the officials responsible for the actions to which we object. We were and we remain most unwilling to abandon the Soviet scientific community, unwilling to breach the bonds of scientific fraternity, and, incidentally, pari passu, both deny to ourselves the full benefit of scientific advances in the Soviet Union and forego the opportunity to discuss with Soviet colleagues the very matters that so much trouble us.

It was already our considered opinion that the individual exchange program--which has always included an element of "scientific tourism"--should not grow and might even be diminished somewhat with relatively little loss.

In contrast, our bilateral symposia--in theoretical astrophysics and solid state physics, experimental psychology, and molecular biology--have been highly successful; by mutual agreement they involved areas in which, in a meeting consisting of 15 scientists per side, there was sure to be essentially equal strength on both sides.

Accordingly, suspending this part of the exchange program, to us the most precious, came very hard. Our scientists enjoyed and profited by them. They had gained new scientific colleagues and personal friends. And yet, we took the only step available to us--a measured step, a painful, hateful, self-denying ordinance concerning this small but precious part of our exchange program.

As we did so, we committed ourselves to reexamine the matter six months later. And reexamine we did.

In the interim, there had been no mitigation of the personal circumstances of those in prison or labor camps, of Sakharov in exile, or of those who had been consigned to some shadowy existence as refuseniks. But a few new names had been added to those lists. And, meanwhile, an increasing body of hard information had appeared in the West documenting the extent of what seems almost official-- or, at least, officially tolerated--antisemitism in the world of Soviet mathematics. The latter development has outraged American mathematicians, a community that deeply believes that mathematical ability alone should be the means of entry into their community, worldwide. The barriers erected against the opportunity of young Soviet Jews to study mathematics surely constitute a gross violation of the language of the Hamburg Communique concerning "equitable opportunity for scientific research" as well as of the language of Basket III condemning discrimination in all forms.

And so, six months later, our Council found no alternative but to notify the Soviet Academy that our bilateral colloquia remain indefinitely suspended.

Nothing, Mr. Chairman, would please us more than a valid reason to reverse that decision, some meaningful indication that these serious problems are receiving the sympathetic attention that they warrant, some indication that Soviet scientists will indeed enjoy those human rights and fundamental freedoms so eloquently described in the language of Baskets I and III.

Mr. Chairman, I regret, indeed I am embarrassed, that my remarks are addressed to problems in a single national member of the CSCE. Admittedly, human rights problems seem to arise almost everywhere. Our Academy's Committee on Human Rights has attempted to defend scientists whose rights have been abrogated in South America, Asia, and Africa, as well as in other European countries. But in none of those countries is science so advanced as in the Soviet Union. And the problems that have accumulated in that country, which is signatory to the Final Act and which we would expect to live by those ethical standards which all 35 signatory nations hold in common, have become so compelling as to warrant the attention of this body.

Mr. Chairman, to American scientists, the question of freedom of inquiry, freedom to write and publish, freedom to speak, to come and go across national borders, freedom to live where one's heart and conscience take one, are indissolubly bound to freedom of one's person. We cannot consider scientific communication as somehow distinct from other forms

of human communication. We perceive no essential distinctions between pursuit of truth about the nature of man or of the physical universe and pursuit of truth about the human condition in the societies in which we live. We will continue to speak out for those whose rights have been denied, for the cost of silence is the abandonment of human rights, and that is a price we will not pay.

If I may quote a colleague:

... Intellectual freedom is essential to human society--freedom to obtain and distribute information, freedom for open-minded and unfearing debate, and freedom from pressure by officialdom and prejudices. Such a trinity of freedom of thought is the only guarantee against an infection of people by mass myths... Freedom of thought is the only guarantee of the feasibility of a scientific democratic approach to politics, economy and culture.

Mr. Chairman, those words were written by a Foreign Member of the National Academy of Sciences of the USA--Andrei Sakharov.

Thank you, Mr. Chairman, for the privilege of the floor on this day.